CUS250M

RELIABILITY DATA

Template	260473 iss 2
DWG. No.	XXXXXX iss X

TDK·Lambda

I N D E X

※Test results are example data based on a unit under our standard measurement condition.

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1. Calculated Values for MTBF

MODEL : CUS250M-24

Calculating Method

Test Specifications:	Telcordia SR332 Issue 4, 2016
Test Method:	Method I-D (Black Box)
Confidence Level:	90%
Environment:	Ground, Fixed, Controlled
Device Method:	I-D
Quality Level:	II

The failure rates in Failures In Time (FITs) is given for the different sub-assemblies at a confidence level of 90% in the table below at 20°C; 30°C; 40°C; 50°C; 60°C; and 70°C.

Telcordia SR332 Issue 4		
Ambient (°C)	FITs	MTBF (hrs)
20	196	5102041
30	278	3597122
40	405	2469136
50	589	1697793
60	858	1165501
70	1250	800000

2. Components Derating List

MODEL : CUS250M-12

Test Conditions

Vout:	12V_{DC}
Vin:	115V_{AC}
Iout:	100% Load
Ambient:	25

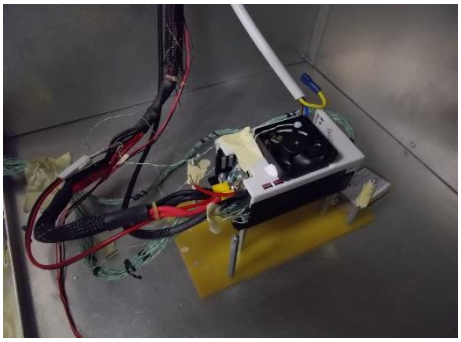
Cir Ref: XQ1 Manu Part No. IPD60R180P7SAUMA1 Manufacturer: Infineon	Tjmax=150°C Pd=3W Tj = Tc + ((θ j-c) × Pd) =114°C D.F.=76%	θ j-c=1.74°C/W ΔTc=5.2°C	Tc=108.78°C
Cir Ref: XQ2/3 Manu Part No. IPD60R180P7SAUMA1 Manufacturer: Infineon	Tjmax=150°C Pd=1W Tj = Tc + ((θ j-c) × Pd) =108°C D.F.=72%	θ j-c=1.74°C/W ΔTc=1.7°C	Tc=102.78°C
Cir Ref: XQ4 Manu Part No. 2SK3018 Manufacturer ROHM	Tjmax=150°C Pd=0.005W Tj = Tc + ((θ j-c) × Pd) =104°C D.F.=69.3%	θ j-c=625°C/W ΔTc=3.1°C	Tc=100.875°C
Cir Ref: XQ5 A/B Manu Part No. 2N7002DWH6327XTS Manufacturer: Infineon	Tjmax=150°C Pd=0.012W Tj = Tc + ((θ j-c) × Pd) =100°C D.F.=66.7%	θ j-c=250°C/W ΔTc=3°C	Tc=97°C
Cir Ref: XD1 - 4 Manu Part No. S5MBHM4G Manufacturer: Taiwan	Tjmax=150°C Pd=1.3W Tj = Tc + ((θ j-c) × Pd) =112°C D.F.=74.7%	θ j-c=13°C/W ΔTc=16.9°C	Tc=95.1°C
Cir Ref: XD5 Manu Part No. S5MBHM4G Manufacturer: Taiwan	Tjmax=150°C Pd=0.3W Tj = Tc + ((θ j-c) × Pd) =114°C D.F.=76%	θ j-c=13°C/W ΔTc=3.9°C	Tc=110.1°C
Cir Ref: XD6 Manu Part No. STTH3L06UFY Manufacturer: ST	Tjmax=175°C Pd=1.54W Tj = Tc + ((θ j-c) × Pd) =118°C D.F.=67.4%	θ j-c=16°C/W ΔTc=24.6°C	Tc=93.36°C

Cir Ref: XU100 Manu Part No: VOL618A-3X001T S Manufacturer: Vishay	Tjmax=125°C Pd=448uW Tj = Tc + ((θ j-c) × Pd) =101°C D.F.=80.8%	θ j-c=0°C/W ΔTc=0°C	Tc=101°C
Cir Ref: XU1 Manu Part No. NCP1611BDR2G Manufacturer: Onsemi	Tjmax=150°C Pd=131mW Tj = Tc + ((θ j-c) × Pd) =113°C D.F.=75.3%	θ j-c=50°C/W ΔTc=0°C	Tc=106.5°C
Cir Ref: XU2 Manu Part No. TEA19161T Manufacturer: NXP	Tjmax=150°C Pd=306mW Tj = Tc + ((θ j-c) × Pd) =113°C D.F.=75.3%	θ j-c=60°C/W ΔTc=0°C	Tc=94.64°C
Cir Ref: XU101 Manu Part No: TEA1995T/1J Manufacturer: NXP	Tjmax=150°C Pd=85mW Tj = Tc + ((θ j-c) × Pd) =108°C D.F.=72%	θ j-c=50°C/W ΔTc=0°C	Tc=103.8°C

3. Main components temperature rise ΔT list

MODEL: CUS250M-12/FJ

Measuring conditions

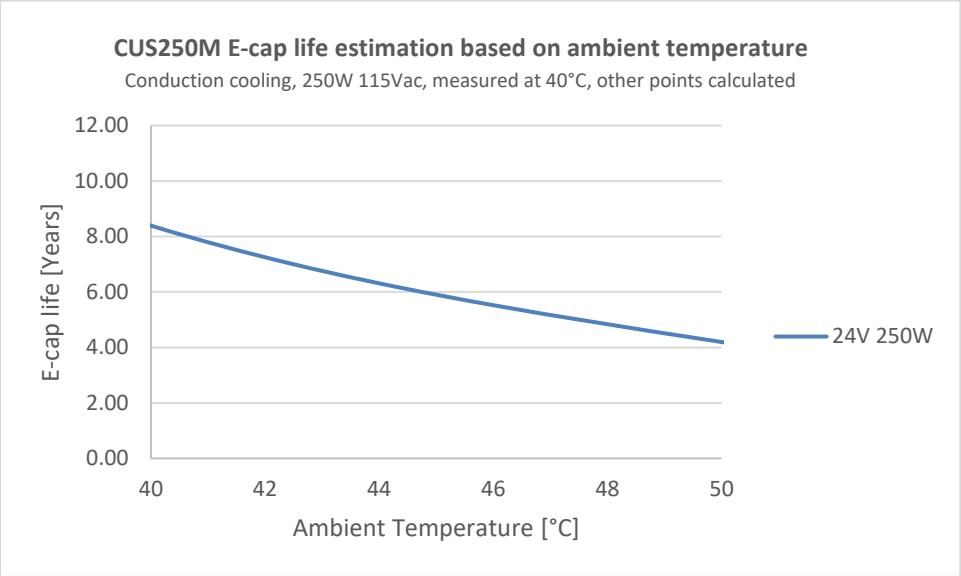
	
Input Voltage (VAC)	100Vac
Output Voltage (VDC)	12V
Output Current (A)	20.80A

Measuring Results

		ΔT Temperature Rise (°C)
Output Derating		**Io = 100% Ta = 50°C**
Location No.	**Parts Name**	**Mounting(A)**
L1	CM Choke	68.9
L3	PFC Choke	72.4
L4	DM Choke	79.0
C5	Film Capacitor	67.2
C11	Film Capacitor	56.0
C6	E-Cap	67.8
C104	E-Cap	56.7
XC104	E-Cap	72.5
XC105	E-Cap	69.2
XC400	E-Cap	54.6
XC502	E-Cap	55.3
C1	X- Cap	77.5
C2	Y-Capacitor	62.0
C3	Y-Capacitor	60.0
C100	Y-Capacitor	58.3
TX1	TRX Primary Winding	76.5
TX300	TRX Winding	56.7
XU100	Opto-Coupler	72.8
XU301	Opto-Coupler	61.7
XU400	Opto-Coupler	63.0
XD2	Bridge Diode	88.6
XQ2	FET	78.7
J1	Input Connector	71.9

4. Electrolytic capacitor lifetime

MODEL: CUS250M



Note : E-cap life calculation is based on 24hrs/day operation.
e.g. For 12Hrs/day operation life numbers will double

5. Vibration Test

MODEL: CUS250M-12/F; CUS250M-12/FJ

(1) Vibration Test Class

Frequency Variable Endurance Test

(2) Equipment Used

Controller:	LDS Dactron Comet
Vibrator:	V830-335 T M8 R-CE
Accelerometer:	DeltaTron 4533-B

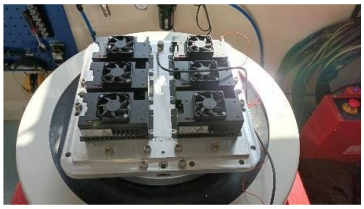
(3) The Number of D.U.T. (Device Under Test)

3 x Units

(4) Test Conditions

Sweep Frequency:	10Hz – 500Hz – 10Hz	Direction:	X, Y, Z
Sweep Time:	1 Octave/ minute	Test Time:	60 Minutes
Acceleration:	2.2G	Non-operation	
Mounting:	Customer Fixings		

(5) Test Method



Standard mounting position as per picture above.

(6) Acceptable Conditions

1. Not to be broken.
2. No abnormal output after test.

(7) Test Results

No mechanical damage observed

6. Thermal shock test

MODEL : CUS250M-12/F; CUS250M-12/FJ; CUS250M-24/FJ

(1) Equipment used

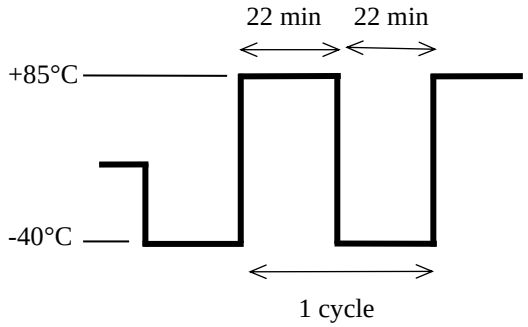
Thermotron Thermal Shock Chamber 6907-2357

(2) The number of PSUT. (Power Supply Under Test)

3 x Units

(3) Test Conditions

Ambient Temperature:	-40°C ↔ 85°C
Test Time:	22min ~ 22min
Test Cycle:	500 cycles
Operating Condition:	Not Operating



(4) Test Method

Before the test, check if there is no abnormal output and put the PSUT in the testing chamber. Then test it in above cycles. After the test is completed, leave it for 1 hour at the room temperature and check to make sure that there is no abnormal output.

(5) Test Results

Visually and electrically OK.